Solutions: Random Variables Checkpoint 3

These two questions refer to the following information:

Color-blindness is any abnormality of the color vision system that causes a person to see colors differently than most people, or to have difficulty distinguishing among certain colors (www.visionrx.xom).

Color-blindness is gender-based, with the majority of sufferers being males.

Roughly 8% of white males have some form of colorblindness, while the incidence among white females is only 1%.

A random sample of 20 white males and 40 white females was chosen.

Let **X** be the number of males (out of the 20) who are color-blind.

Let **Y** be the number of females (out of the 40) who are color-blind.

Let **Z** be the total number of color-blind individuals in the sample (males and females together).

Question 1

Select one answer.
10 points

Which of the following is true about the random variables X, Y, and Z?

- (a) X is binomial with n = 20 and p = .08.
- (b) Y is binomial with n = 40 and p = .01.
- (c) Z is not binomial.
- (d) All of the above are true.
- (e) Only (a) and (b) are true.

Correct answer: (d)

Question 2

Select one answer.
10 points

What is the probability that exactly 2 of the 20 males are color-blind? (Note: Some answers are rounded.)

- (a) .08
- (b) .2711
- (c) .0143
- (d) .5422
- (e) .0159

Correct answer: (b)

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